

**DETAILED SPECIFICATIONS
COLD WATER METERS - DISPLACEMENT TYPE
MAGNETICALLY DRIVEN
WITH ITRON ELECTRONIC READING TRANSMITTER (ERT) AND
RADIO FREQUENCY METER READING SYSTEM**

Section 1 - Scope

This specification covers positive displacement cold water meters in sizes ¾" thru 2". The displacement meters must be of the type known as nutating disc meters, which are positive in action in that the discs displace or carry over a fixed quantity of water for each nutation of the disc when operated under positive pressure. Meters shall conform to latest revision of AWWA C700/C710.

Section 2 – Operating and Physical characteristics

Operating characteristics of the meters shall exceed AWWA minimum standards as detailed in Table 1 in each of the following areas:

- Normal flow range
- Low flow accuracy
- Maximum continuous flow
- Nutations
- Pressure loss at maximum flow

Meters shall be manufactured using the low-lead alloy Envirobrass II.

A lead-free, thermoplastic model shall also be available in 5/8"x3/4", ¾"x9", and 1" sizes.

All meters shall have an outer case with separate, removable measuring chambers. Casings shall not be repaired in any manner. The inlet and outlet shall have a common axis. Connection flanges shall be parallel.

The size, model and direction of flow through the meters shall be molded/cast in the top side of all meter outer cases.

1-1/2" and 2" meters shall have flanged ends.

Test plug ports shall be provided if requested in the outlet side of 1-1/2" and 2" meters.

Table 1

		Badger Recordall	AWWA Min. Standards
Laying length	5/8"	7-1/2"	7-1/2"
	3/4"	7-1/2" and 9"	7-1/2" and 9"
	1"	10-3/4"	10-3/4"
	1 1/2"	13"	13"
	2"	17"	17"
Operating Accuracy Normal Flow Range	5/8"	1/2-25 GPM	1-20 GPM
	3/4"	3/4-35 GPM	2-30 GPM
	1"	1 1/4-70 GPM	3-50 GPM
	1 1/2"	2 1/2 - 120 GPM	5 - 100 GPM
	2"	2 1/2 - 170 GPM	8 - 160 GPM
Accuracy @ Low Flow	5/8"	1/4GPM @ 98.5%	1/4GPM @ 95%
	3/4"	3/8GPM @ 97%	1/4GPM @ 95%
	1"	3/4GPM @ 95%	3/4GPM @ 95%
	1 1/2"	1 1/4 GPM @ 95%	1 1/2 GPM @ 95%
	2"	1 1/2 GPM @ 95%	2 GPM @ 95%
Maximum Continuous Flow	5/8"	15 GPM	10 GPM
	3/4"	25 GPM	15 GPM
	1"	50 GPM	25 GPM
	1 1/2"	80 GPM	50 GPM
	2"	100 GPM	80 GPM
Nutations/Oscillations per Gallon	5/8"	49.59	58
	3/4"	31.6	33.3
	1"	11.7	15.3
	1 1/2"	5.97	6.7
	2"	3.6	4
Pressure Loss at AWWA Max. Flow	5/8"	4.9 PSI	15 PSI @ 20GPM
	3/4"	7.3 PSI	15 PSI @ 30GPM
	1"	6.5 PSI	15 PSI @ 50 GPM
	1 1/2"	7.5 PSI	15PSI @ 100GPM
	2"	8.6 PSI	15PSI @ 160GPM
Optional Test Port	1 1/2"	YES	
Optional Test Port	2"	YES	

Section 3 – Meter Warranties

All meters shall carry the following published warranties:

All ¾-inch and 1-inch meters shall be guaranteed to be free from defects in materials and workmanship for 12 months after shipment, and to meet AWWA C700-25 new meter accuracy standards for a period of five (5) years from the date of shipment, or registration as itemized below:

¾-inch	750,000 U.S. gallons
1-inch	1,100,000 U.S. gallons

All 1-1/2-inch and 2-inch meters shall be guaranteed to be free from defects in materials and workmanship for 12 months after shipment, and to meet AWWA C700-25 new meter accuracy standards for a period of two (2) years from the date of shipment, or registration as itemized below:

1-1/2-inch	1,600,000 U.S. gallons
2-inch	2,100,000 U.S. gallons

At the expiration of this period, meters shall be guaranteed to meet AWWA C700 repaired meter accuracy standards as specified below:

¾-inch	15 years from date of shipment or registered usages of 2,500,000 U.S. gallons.
1-inch	15 years from date of shipment or registered usages of 3,250,000 U.S. gallons.
1-1/2-inch	15 years from date of shipment or registered usages of 5,600,000 U.S. gallons.
2-inch	15 years from date of shipment or registered usages of 10,400,000 U.S. gallons.

Section 4 – Registers

4.1 Straight Read and Electronic Encoder Registers (EER)

All meters shall permit the use of either a straight reading, permanently sealed local register or an electronic encoder register for connection to an automatic or automated meter reading system.

The register shall not be in contact with the water being measured.

The register devices shall be so designed to permit removal and exchange without removal of the meter from the service installation or interruption of service water supply.

Registers shall be of the center sweep test hand type that covers the entire dial face and a totalizing odometer.

The register shall be equipped with a separate flow indicator for detecting small rates of flow, and shall display it in blue for Cubic Feet.

The meter size and unit of registration, (cubic feet), shall be clearly designated on dial face.

The register must come equipped with a lid that covers the entire register face and is factory stamped with the meter serial number.

Registers shall be connected to the main case of the meter through the use of a security screw (torx) requiring a special tool for removal not readily available in the market place.

As an option, bronze register shrouds and lids shall be available for the straight-reading registers

4.2 Electronic Encoder Register (EER) – Additional Requirements

The digital output of the encoder is equal to 1/10 of the quantity indicated by a single revolution of the test hand.

The register must be factory pre-wired to integrally mounted AMR devices requiring no wiring in the field.

The EER shall be encased in a housing which shall be a scratch resistant glass lens and a non-corrosive metal bottom. No plastic register lens or bottom are allowed.

The EER must be permanently sealed to provide moisture resistance to flooded pit or submerged conditions. The permanent seal between the glass lens and copper (metal) bottom shall utilize an adhesive seal without the use of gaskets.

Absolutely no gasketed seals or oil-filled encoder registers shall be accepted.

The EER must not be able to turn backwards.

The EER must have a low profile consistent with a straight read register of approximately 2". All wiring must be through the back of the register to reduce overall EER height.

4.3 Warranties

All straight reading register assemblies shall be guaranteed for a period of twenty-five (25) years from the date of manufacture.

All digital and absolute encoder registers shall be guaranteed for a period of ten (10) years from date of manufacture.

Section 5 – Itron ERTs

All Itron ERTs shall come pre-programmed and ready for immediate installation. ERTs shall come with necessary mounting hardware to include a mounting bracket for the appropriate size meter box or vault.

Section 6 – Reclaimed Water Meter Option

All positive displacement meters shall also be available for reclaimed water service applications, with operating characteristics listed in Table 1.

All reclaimed meters will have SS bolts and bronze housings marked “Reclaimed” Meters 1” and smaller will also have a bronze bottom marked “Reclaimed”.

Both straight reading and EER registers will include lavender plastic shroud and lid marked with the international non-potable drinking water symbol, lavender register face marked “Reclaimed”, Torx seal screw and cubic foot registration.

Section 5 – Customer Service and Technical Support

5.1 Customer Service

Supplier will have a fully stocked warehouse within approximately 100 miles to supply the City with required product in a timely fashion.

Standard shipments shall be made at the supplier’s expense, FOB destination. Freight charges for emergency or rush orders shall be negotiated on a case by case basis.

Standard payment terms shall be Net 30 days.

5.2 Technical Support

Supplier will employ a technical support specialist with experience in supporting an Itron radio read system. This shall include knowledge and experience with the City’s utility billing system and its interface with Itron’s route management software, handheld and mobile operations, field installations and system trouble shooting.

This specialist shall be available as a first-line response, providing on-site local support for any technical issues that may arise from time to time including training or re-training of City staff in the effective use of their Itron meter reading system.